

PROFILE SHEET **Biology**

Publisher: Holt, Rinehart & Winston

Text/Instructional Material Title: Modern Biology, 2002

Science Standard	Rating		
	Adequate	Limited	No Evidence
BIO.1	✓		
BIO.2	✓		
BIO.3	✓		
BIO.4	✓		
BIO.5	✓		
BIO.6	✓		
BIO.7	✓		
BIO.8	✓		
BIO.9	✓		
Additional Criteria			
BIO-AC.1	✓		
BIO-AC.2	✓		
BIO-AC.3	✓		
BIO-AC.4	✓		
BIO-AC.5	✓		

The Virginia Department of Education recommends to the Board of Education:

YES ✓

NO _____

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	Adequate	Limited	No Evidence
BIO.1 The student will plan and conduct investigations in which			
a) observations of living organisms are recorded in the lab and in the field;	✓		
b) hypotheses are formulated based on direct observations and information from the scientific literature;	✓		
c) variables are defined and investigations are designed to test hypotheses;	✓		
d) graphing and arithmetic calculations are used as tools in data analysis;	✓		
e) conclusions are formed based on recorded quantitative and qualitative data;	✓		
f) sources of error inherent in experimental design are identified and discussed;	✓		
g) validity of data is determined;	✓		
h) chemicals and equipment are used in a safe manner;	✓		
i) appropriate technology, including computers, graphing calculators, and probeware, is used for gathering and analyzing data and communicating results;	✓		
j) research utilizes scientific literature;	✓		
k) differentiation is made between a scientific hypothesis and theory;	✓		
l) alternative scientific explanations and models are recognized and analyzed; and	✓		
m) a scientific viewpoint is constructed and defended (the nature of science).	✓		
Overall Rating for Standard	✓		

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	Adequate	Limited	No Evidence
BIO.2 The student will demonstrate scientific reasoning and logic by			
a) evidence supporting the cell theory;	✓		
b) scientific explanations of the development of organisms through time (biological evolution);	✓		
c) evidence supporting the germ theory of infectious disease;	✓		
d) development of the structural model of DNA; and	✓		
e) the collaborative efforts of scientists, past and present.	✓		
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	Adequate	Limited	No Evidence
BIO.3 The student will investigate and understand the chemical and biochemical principles essential for life. Key concepts include			
a) water chemistry and its impact on life processes;	✓		
b) the structure and function of macromolecules;	✓		
c) the nature of enzymes; and	✓		
d) the capture, storage, transformation, and flow of energy through the processes of photosynthesis and respiration.	✓		
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	Adequate	Limited	No Evidence
BIO.4 The student will investigate and understand relationships between cell structure and function. Key concepts include			
a) characteristics of prokaryotic and eukaryotic cells;	✓		
b) exploring the diversity and variation of eukaryotes;	✓		
c) similarities between the activities of a single cell and a whole organism; and	✓		
d) the cell membrane model (diffusion, osmosis, and active transport).	✓		
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	Adequate	Limited	No Evidence
BIO.5 The student will investigate and understand life functions of archaeobacteria, monerans (eubacteria), protists, fungi, plants, and animals, including humans. Key concepts include			
a) how their structures and functions vary between and within the kingdoms;	✓		
b) comparison of their metabolic activities;	✓		
c) analyses of their responses to the environment;	✓		
d) maintenance of homeostasis;	✓		
e) human health issues, human anatomy, body systems, and life functions; and	✓		
f) how viruses compare with organisms.	✓		
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	Adequate	Limited	No Evidence
BIO.6 The student will investigate and understand common mechanisms of inheritance and protein synthesis. Key concepts include			
a) cell growth and division;	✓		
b) gamete formation;	✓		
c) cell specialization;	✓		
d) prediction of inheritance of traits based on the Mendelian laws of heredity;	✓		
e) genetic variation (mutation, recombination, deletions, additions to DNA);	✓		
f) the structure, function, and replication of nucleic acids (DNA and RNA);	✓		
g) events involved in the construction of proteins;	✓		
h) use, limitations, and misuse of genetic information; and	✓		
i) exploration of the impact of DNA technologies.	✓		
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	Adequate	Limited	No Evidence
BIO.7 The student will investigate and understand bases for modern classification systems. Key concepts include			
a) structural similarities in organisms;	✓		
b) fossil record interpretation;	✓		
c) comparison of developmental stages in different organisms;	✓		
d) examination of biochemical similarities and differences among organisms; and	✓		
e) systems of classification that are adaptable to new scientific discoveries.	✓		
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	Adequate	Limited	No Evidence
BIO.8 The student will investigate and understand how populations change through time. Key concepts include			
a) evidence found in fossil records;	✓		
b) how genetic variation, reproductive strategies, and environmental pressures impact the survival of populations;	✓		
c) how natural selection leads to adaptations;	✓		
d) emergence of new species; and	✓		
e) scientific explanations for biological evolution.	✓		
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	Adequate	Limited	No Evidence
BIO.9 The student will investigate and understand dynamic equilibria within populations, communities, and ecosystems. Key concepts include			
a) interactions within and among populations including carrying capacities, limiting factors, and growth curves;	✓		
b) nutrient cycling with energy flow through ecosystems;	✓		
c) succession patterns in ecosystems;	✓		
d) the effects of natural events and human influences on ecosystems; and	✓		
e) analysis of the flora, fauna, and microorganisms of Virginia ecosystems including the Chesapeake Bay and its tributaries.	✓		
Overall Rating for Standard	✓		

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Additional Criteria	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
1. Safe use of materials and equipment is encouraged.	✓		
Overall Rating for Additional Criteria 1	✓		
2. Materials emphasize the use of effective instructional practices and learning theories. <ul style="list-style-type: none"> • Students are guided through different approaches such as the learning cycle. • Students are provided the opportunity to conduct scientific inquiry appropriate for their age, grade, and maturity. • Concepts are introduced through concrete experiences. • Students are required to use manipulative materials during investigations and activities. • Multiple opportunities are provided for students to apply concepts. • Learning activities offer opportunities for students to revise their prior knowledge and create new knowledge. • Students are encouraged to pose questions and to identify problems, as well as propose multiple solutions and design and conduct tests of inference. • Students collect and interpret data through a variety of technologies and draw conclusions based on that data. 	✓		
Overall Rating for Additional Criteria 2	✓		

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Additional Criteria	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
3. Materials present content in an accurate, unbiased manner, and are based on sound science. <ul style="list-style-type: none"> Materials do not contain content errors (omissions of current content, out-of-date content, overgeneralizations, etc.).* Materials do not contain production errors (misspelled words, word omissions, incorrect answers).* Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. The materials are free of non-scientific explanation. 	✓		
Overall Rating for Additional Criteria 3	✓		

*Please note that the Department of Education does not certify that all inaccuracies and/or grammatical errors have been detected in this instructional item and reported in this correlation profile.

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	Adequate	Limited	No Evidence
<p>4. Materials promote student assessment as an integral part of the instructional process.</p> <ul style="list-style-type: none"> Assessment suggestions and scoring criteria for student performances on work such as lab practicals or tasks, concept maps, research projects, observation checklists, etc., are provided. Assessment items include multiple-choice, short answer, essay and open-ended questions with charts, graphs, and diagrams imbedded within the items. Options include techniques for assessing students' prior knowledge. Assessment items reflect the rigor and the intent of the standards. For example, they require students to use higher order thinking skills to apply, analyze, synthesize, evaluate, and make judgments or recommendations. 	✓		
Overall Rating for Additional Criteria 4	✓		

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	Adequate	Limited	No Evidence
5. Materials are presented in an organized, logical manner and are appropriate for the age, grade, and maturity of the students. <ul style="list-style-type: none"> • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. • Writing style, length of sentences, and vocabulary are appropriate. • Graphics and illustrations are appropriate. • Level of abstraction is appropriate, and real life examples, including careers are provided. • Sufficient applications are provided to promote depth of understanding. 	✓		
Overall Rating for Additional Criteria 5	✓		